IN THE CLAIMS

Claims 1, 3, 5, 7-9, 11, 24, 28, 32, 34-43 and 45-53 are pending. No claims are amended.

1. (previously presented) A catalytic system comprising a tethered catalyst composition disposed in a microchannel, wherein the microchannel comprises a bulk flow path, wherein the tethered catalyst composition comprises a solid support onto which has been immobilized an otherwise ordinarily molecular catalyst or procatalyst moiety; and

wherein the microchannel comprises at least one wall and wherein at least one heat transfer microchannel is adjacent to the at least one wall of the microchannel.

2. (canceled)

3. (previously presented) The catalytic system of claim 1 wherein the tethered catalyst composition is attached to at least one wall of the microchannel that defines the bulk flow path in the microchannel.

4. (canceled)

5. (original) The catalytic system of claim 1 wherein said tethered catalyst composition or tethered chiral auxiliary is provided as, or part of, a porous insert.

6. (canceled)

7. (previously presented) The catalytic system of claim 1, wherein said tethered catalyst composition comprises a solid support selected from the group consisting of: a solid inorganic oxide, carbon, an organic polymer, silica, alumina, a clay, a zeolite and a mesoporous solid.

8. (previously presented) A catalytic system comprising a tethered catalyst composition disposed in a microchannel, wherein the microchannel comprises a bulk flow path, wherein the tethered catalyst composition comprises a solid support onto which has been immobilized an otherwise ordinarily molecular catalyst or procatalyst moiety; and

wherein the microchannel comprises at least one wall and the tethered catalyst composition is coated on the wall of the microchannel; and

tethered catalyst composition comprises a tether with at least a three atom chain.

9. (previously presented) The catalytic system of claim 8, wherein the tethered catalyst composition comprises one or more member selected from the group consisting of a metal, a metal coordination complex, an organometallic complex, an oxidant, a reductant, an acid, and a base.

10. (canceled)

11. (previously presented) A catalytic system comprising a tethered catalyst composition disposed in a microchannel, wherein the microchannel comprises a bulk flow path, wherein the tethered catalyst composition comprises a solid support onto which has been immobilized an otherwise ordinarily molecular catalyst or procatalyst moiety; and

wherein the microchannel comprises at least one wall and the tethered catalyst composition is coated on the wall of the microchannel; and

further comprising a micromixer positioned to mix reactants prior to passage into the microchannel.

12-23. (canceled)

24. (original) The catalytic system of claim 1 wherein the microchannel comprises at least one wall and a tethered catalyst or a tethered chiral auxiliary is coated on the wall of the microchannel.

25-27. (canceled)

28. (previously presented) A catalytic system comprising a tethered catalyst composition disposed in a microchannel, wherein the tethered catalyst composition comprises a solid support onto which has been immobilized an otherwise ordinarily molecular catalyst or procatalyst moiety; and

wherein the microchannel comprises at least one wall and the tethered catalyst composition is coated on the wall of the microchannel; and

wherein the microchannel comprises a chiral auxiliary.

29-31. (canceled)

32. (previously presented) The catalytic system of claim 1, wherein the system comprises a tethered catalyst composition comprising a dendritic catalyst.

33. (canceled)

34. (previously presented) The catalytic system of claim 1 wherein the microchannel comprises a minimum dimension of greater than 1 μm and a length greater than 1 cm.

35. (previously presented) The catalytic system of claim 8, comprising at least one heat transfer microchannel that is adjacent to at least one wall of the microchannel.

36. (previously presented) The catalytic system of claim 35 wherein the at least one wall of the microchannel is comprised of an iron-containing alloy.

37. (previously presented) The catalytic system of claim 34 comprising at least 3 arrays of planar microchannels that comprise a tethered catalyst composition or a tethered chiral auxiliary disposed in

the microchannels.

38. (previously presented)The catalytic system of claim 34 comprising at least 10 layers of heat exchangers interleaved with at least 10 layers comprising the microchannels that comprise a tethered catalyst composition or a tethered chiral auxiliary disposed in the microchannels.

39. (previously presented)The catalytic system of claim 34 comprising a bridging oxo group connecting a transition metal center of a tethered catalyst with a metal or semimetal on a surface of the interior of the microchannel.

40. (previously presented)The catalytic system of claim 1 wherein said tethered catalyst composition is made from an inorganic compound comprising $Ni[P(OMe)_3]_4$, $NiCl_2(PEt_3)_2$, $RhH(CO)(PPh_3)_3$, $RhCl(CO)(PPh_3)_2$, or $IrCl(CO)(PPh_3)_2$.

41. (previously presented)The catalytic system of claim 34 comprising at least 10 of the microchannels that comprise a tethered catalyst composition or a tethered chiral auxiliary disposed in the microchannel.

42. (previously presented) The catalytic system of claim 3 wherein the bulk flow path comprises a gap of 0.1 to 1.0 mm.

43. (previously presented)The catalytic system of claim 8 wherein the system comprises a tethered catalyst composition made by reacting $Cl\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}SiH_3$, $Cl\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}Si(OCH_3)_3$, or $Cl\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}NH_2$ with a support surface.

44. (canceled)

45. (previously presented)The catalytic system of claim 1 wherein the system comprises a tethered catalyst composition made by reacting a metal complex with a tether that is subsequently reacted with an inorganic support.

46. (previously presented)The catalytic system of claim 1 wherein the system comprises a tethered catalyst composition comprising a tethered metallocene.

47. (previously presented)The catalytic system of claim 1 wherein the system comprises a tethered catalyst composition comprising a Schiff base palladium catalyst.

48. (previously presented)The catalytic system of claim 47 wherein a surface is modified with an aminopropyl tether.

49. (previously presented) The catalytic system of claim 28 wherein the microchannel comprises a bulk flow path.

50. (previously presented) The catalytic system of claim 1 wherein the microchannel comprises a cross section, and wherein the bulk flow path comprises at least 50% of the cross section of the microchannel.

51. (previously presented) The catalytic system of claim 1 wherein the microchannel comprises a cross section, and wherein the bulk flow path comprises 30% to 80% of the cross section of the microchannel.

52. (previously presented) The catalytic system of claim 1 wherein the tethered catalyst is in the form of a porous material in which at least 50% of the material's pore volume is in the size range of 0.1 to 300 μm.

53. (previously presented) The catalytic system of claim 1 wherein tethered catalyst composition comprises an amino-modified silica.